PIPE LINE IN CASING PIPE/TUNNEL

ITEM 1800

PART 1 – GENERAL

WORK INCLUDED: (Sec. 01) Furnish and install boring-receiving pits, carrier pipe in a casing pipe or tunnel liner plates, test and, if required, sterilize the carrier pipe, as indicated on the Drawings and specified.

RELATED WORK: (Sec. 02) Furnished/paid for in this Item: (as applicable)

Earth Excavation/Backfill including boring and receiving pits.
Rock Excavation and Backfill including boring and receiving pits
Concrete
Testing of Pipe Lines and Sewers
Sterilization of Potable Water Lines and Tanks

QUALITY ASSURANCE: (Sec. 03) Materials shall be new and of the best quality.

REFERENCES: (Sec. 04) (as applicable)

ASTM	American Society for Testing and Materials
AREA	American Railway Engineering Association – Part 5, Pipe Line Crossing
CE – 8	Specifications for Pipeline Occupancy for Railroad Company Property
ODOT	Ohio Department of Transportation, Construction and Materials Specifications

SUBMITTALS: (Sec. 05) Provide the following to Engineer:

a. Shop Drawings, as per General Conditions
b. Drawings showing proposed skids and bulkheading, jacking shield or boring arrangement.

No work shall begin on the actual installation until all submittals have been received and approved by the proper reviewing authorities.

MEASUREMENT/PAYMENT: (Sec. 06) Measurement/payment will be per lineal foot, measured along the centerline of the casing pipe or tunnel liner, not to exceed that indicated on the Drawings unless directed in writing by the Resident Representative and include all labor, work, and materials stated.

WARRANTY: (Sec, 07) See General Conditions

PART 2 – PRODUCTS

MATERIALS: (Sec. 08)

Carrier Pipe as specified on the Drawings, and conform to its respective Item.

Casing Pipe steel, ASTM A-53, Grade B, with smooth bore and smooth exterior, minimum yield of 35,000 psi. Size and wall thickness as indicated on the Drawings. Steel casing pipe shall conform to ASTM A-53, Grade B.

Tunnel liner plates cold formed steel, minimum yield of 28,000 psi. minimum tensile of 45,000 psi, bituminous coated.

Liner plates shall be fabricated to fit the cross section of the tunnel.

All plates shall be connected to bolts on both the longitudinal and circumferential seams or joints, fabricated to permit complete erection from the inside of the tunnel.

Grout holes two inches or larger in diameter shall be provided. They shall be plain or tapped, with tapped holes provided with a pipe plug screwed in place.

Bolts and nuts shall conform to ASTM A-307, Grade A.

Grout fill shall be 1:4 cement and mason sand.

Sand fill shall be fine aggregate.

Concrete shall conform to Item 500.

Lubricant shall be bentonite or other approved materials.

PART 3 – EXECUTION

INSPECTION: (Sec. 09) The Contractor shall inspect the location of the work and familiarize himself with the conditions under which the work will be performed and with all necessary detail as to the orderly prosecution of the work. The omission of any details for the satisfactory installation of the work in its entirety not indicated on the Drawings or specified herein, shall not relieve the Contractor of full responsibility.

PREPARATION: (Sec. 10) Contractor shall familiarize himself with all requirements of railroads, highways, local laws and ordinances. Installation shall conform to all requirements.

Contractor shall provide necessary insurance at no additional cost to the Owner.

INSTALLATION: (Sec 11) All jacking/boring or tunnel operations shall be performed on a continuous, 24 hour a day basis, if required by the respective Highway Department or Railroad Company.

All excavation and backfill shall be performed for pits and for installation of casing pipe or tunnel liner plates.

All sheeting, shoring and dewatering shall be performed as required to accomplish the proper installation of the boring-receiving pits, casing pipe or tunnel liner plates and carrier pipe.

Water jetting not permitted.

Casing Pipe: Casing pipe shall be installed by the jacking method. A suitable jacking pit shall be excavated and properly shored and braced and reaction bracing installed.

A cradle of timber or concrete shall be built upon which the casing pipe shall be placed to the correct line and grade. No changes in line or grade will be permitted except with written permission of the Engineer.

The end of the casing pipe shall be kept ahead of excavation unless the earth is too hard to permit such jacking.

Boring inside the casing pipe will be permitted provided the Contractor has suitable equipment and proper boring arrangement at the head of the casing pipe. If the casing pipe comes in short lengths, the sections shall be welded circumferentially in a workmanlike manner. Welds shall be watertight and capable of withstanding the jacking pressure without distortion.

Lubricant may be used on the outside of the casing pipe.

Augers shall not be pulled once operation is started.

Liner Plates: Liner plates shall be installed by the tunnel method, in accordance with the manufacturer's recommendations and all applicable requirements of the Industrial Commission of the State of Ohio.

Shafts shall be properly sheeted and shored to protect the work and adjacent structures. The shafts shall be located at the site of manholes or special structures wherever possible.

The Contractor shall provide all supports necessary to prevent settlement of pavement, buildings, railroad tracks, or other superimposed loads. If the Resident Representative is of the opinion that sufficient supports have not been provided, he may recommend the furnishing and placing of additional bracing, sheeting or timbering, at the expense of the Contractor; but compliance with, or failure of, the Resident Representative to give such recommendations shall not release the Contractor from his responsibility for the sufficiency of such supports.

All excavated materials shall be removed from the site of the work; not accumulation of spoil shall be permitted in or near tunnel shafts.

Voids between the liner plates and the tunnel wall shall be force-grouted. The grout shall be forced through the grouting holes in the plates with such pressure that all voids will be completely filled. Void between liner plate and tunnel wall shall be kept to a minimum, and shall not exceed 1 inch to 2 inches.

Grout plates shall be installed at a maximum of 5 foot staggered centers. Plates shall be placed 15 to 50 degrees off the top centerline. Grouting shall be performed upon the completion of the installation of a maximum of six feet of liner plates, or as directed by the Resident Representative. Grouting shall be done with a positive displacement grout pump. No air displacement pump will be permitted for use in grouting between earth and liner plate or in confined areas

Carrier Pipe: The carrier pipe shall be installed using plastic centralizers to maintain clearance between the outside of the carrier pipe and the inside force of the casing pipe or liner plate. After the pipe is properly jointed, aligned and secured or braced in the casing pipe or liner plate, the entire space between the pipe and the inside of the casing pipe or liner plate shall be completely filled with sand or grout. It shall be carefully placed so that proper alignment and grade of the carrier pipe will be maintained. Sand or grout shall be used to fill voids as called for on the Drawings.

Suitable bulkheads shall be provided at each end of the casing or tunnel.

FIELD QUALITY CONTROL: (Sec. 12)

Testing: Lines shall be tested by the Contractor for the service to which they will be subjected to, or as directed by the Resident Representative, as specified in Item 1600, Testing of Pipe Line and Sewers.